BIS910

东胜创新生物科技有限公司
Eastwin Life Sciences, Inc.

Bio-Imaging Systems
Web site: http://www.dnr-is.com/
Email: support@dnr-is.com

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Contact us at: +972-2-570-0818
USA Toll-free number: 1-866-300-4286
email: support@dnr-is.com

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Introduction

The BIS910 is a superior and affordable gel documentation system. The simple user interface provides laboratory researchers with quick, accurate image acquisition and results. These two systems are table top gel imaging systems that support both fluorescent and colorimetric (visible dye) applications. This Operator's Manual is designed to guide the operator through all the required steps in order to scan gel samples.

Once you are more familiar with the system, you may want to refer to *The BIS910 Quick Reference Guide*, which is a more condensed version of this guide intended for experienced users.

Features and Benefits

The key features that make the BIS910 the choice for life science researchers include:

- Real time image, viewing and analysis.
- Scientific high resolution camera.
- Compact, safe and easy to use.
- Superior optics with super bright lens, which brings to ultimate results.
- Unique D – Transilluminator with two dedicated drawers for Fluorescence and visible dye applications.

Introduction

This User Guide is one of two documents packaged with your BIS910 system. To better utilize your system read the next chapter, " Installing Your BIS910 System," before proceeding to the rest of the guide. Once your system is installed and operational, you can then familiarize yourself with the system's different features and procedures.

Everything you need to know about your BIS910 system is included in this guide. Pay special attention to the highlighted chapters below. They contain information that you may need to refer to in your day-to-day use of the BIS910 system.

Topics Covered	Chapter	
An introduction to the manual and the topics covered	Introduction	1
An introduction to the BIS910 and the GelCapture software.	Hardware and software	2
Hardware installation instructions and configurations	Installation procedures	3
Work Flow	BIS910	4
Installation procedures	Software and drivers	5
Step-by-step Operating Instructions	Capturing, saving, imaging tools etc.	6
A listing of the most common issues and how to resolve each	Troubleshooting	7
A list of terms used in this guide and their definitions.	Glossary	8

Hardware System Overview

Each compactly designed BIS910 contains a high-resolution camera and GelCapture software to provide the perfect solution for high quality imaging results. The BIS910 Imager is a user-friendly, high sample imaging tool.

The BIS910 is constructed of two components: a camera tower and a D-Transilluminator which provides UV and White Light lower illumination. GelCapture also previews and saves the scanned images, which are then exported for analysis. Configurations can also be saved and later recalled for use with future samples.

The BIS910 Unit

The BIS910 comprises of the following main components:

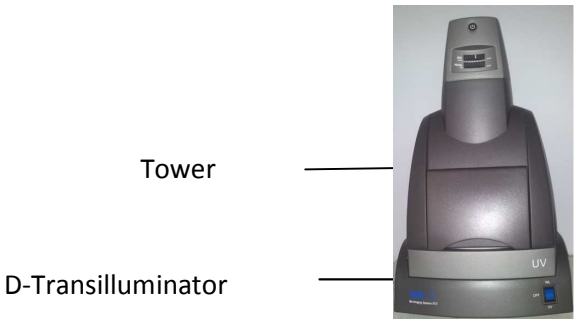


Fig. 1 BIS910

BIS910

Camera Tower

The BIS910 camera tower holds a high-resolution camera. It connects directly to a PC through its attached 2.0 USB compliant cable. The camera tower sits on the D – Transilluminator. A vertical empty chamber extends directly below the camera providing the measured distance between the camera, lens and the D-Transilluminator where the sample image is captured.

Fig. 2 BIS910

In order to prepare the BIS910 for operational use, the user must connect the following cables:

- The **USB 2.0 cable**: from the camera tower to the PC.
- The **Interlocking cable** between the camera tower and the D – Transilluminator.
- The **D - Transilluminator Power supply cable** from the D – Transilluminator to the electrical socket

D-Transilluminator

Fig. 3 D-Transilluminator

The D-Transilluminator can be used by itself as a standalone system or with the camera tower.

The D-Transilluminator is provided for use with two interchangeable drawers, one for white light (WL) and one for ultraviolet (UV) light. However when the BIS910 operates on Dual-UV (see details on Page 15 below), the UV drawer must be used with a visible dye converter (see Visible Dye Converter on Page 14 below). The Light Selection Switch is located on the front panel of the D-Transilluminator.

This lower, D-Transilluminator unit is designed for maximum safety, ensuring that personnel are not exposed to harmful light. This integral safety feature assures you that if the BIS910 door or drawer is opened, there is automatic light cut-out. The light only turns on following correct insertion of the drawer and after the BIS910 door is closed.

Fig 4 D-Transilluminator – Front View

Rear View

The back panel of the D -Transilluminator holds the cable connections, the Power On/Off switch, and the BIS910 Bypass switch.

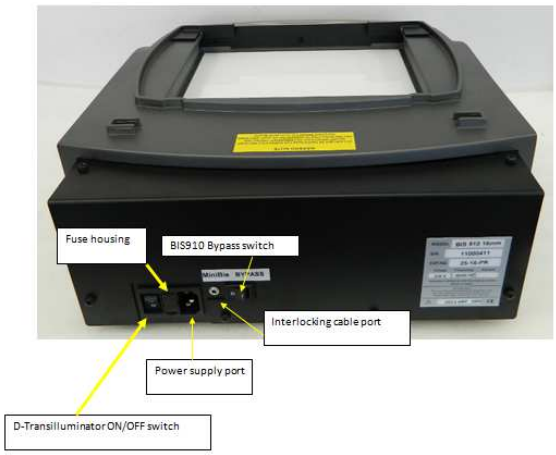


Fig. 5 D-Transilluminator - Rear View

After connecting all the cables and setting the BIS910 Bypass switch to the appropriate position, the user should then advance to the GelCapture operation section.

Operating the BIS910 Bypass: When the D-Transilluminator is used by itself as a standalone system the BIS910 Bypass switch should be set to the **Bypass** position before preparing for image acquisition.

When the BIS910 is combined with the D-Transilluminator, the BIS910 Bypass switch should be set to the BIS910 position.

Fig.6 BIS910 Bypass Switch

Note:

The D–Transilluminator may be used as a stand-alone transilluminator.

Warning: since UV radiation is harmful, the user must use appropriate safety equipment when operating the D-Transilluminator without the BIS910 camera tower. The user should also protect his eyes when using WL intensive illumination without the camera tower.

Accessories

Visible Dye Converter

While the BIS910 is provided with the Dual UV configuration (see details on page 15 below), it has only UV illumination sources. In order to provide the user with the ability to detect samples which are stained with visible dyes, the user should use the visible dye converter as required for converting and detecting samples under UV illumination.

To Detect Visible Stained Gels

1 Pull out the BIS910 UV drawer.
2 Place the Visible Dye Converter on the UV drawer.
3 Place your sample on the Visible Dye Converter.
4 Turn the illumination on from one of the light sources.
5 Continue to work as you would without the white light converter.

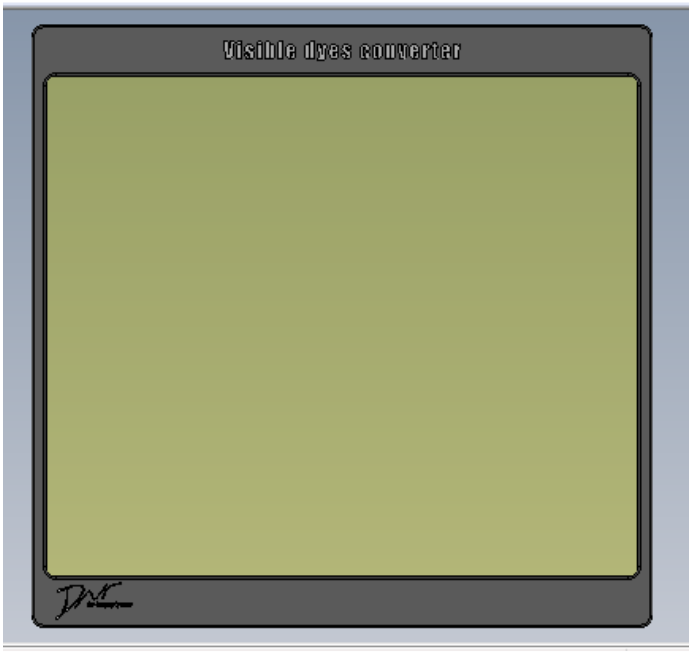


Fig. 12 Visible Dye Converter

Dual UV Configuration

The standard D–Transilluminator is equipped with single type of UV and a single type of white illumination source. Upon user request, we can implement a second type of UV source. e.g.: We can supply two of the following options: 254 nm; 312 nm; 365 nm.
Implementing these two kinds of UV sources is defined as Dual UV configuration.

When you use the Dual UV configuration, the D–Transilluminator lacks white light sources. Therefore you will have to use the White Light converter in order to detect samples which are stained with visible dyes. Refer to the Visible Dyes Converter immediately above this section. The BIS910 will be provided only with the UV drawer and the Visible Dye converter (beside of the White Light drawer).

Installing Your BIS910 System

This section is designed to help you quickly install your new BIS910 system. Once you have completed these steps, your BIS910 should be completely operational.

The first part reviews:

- Safety requirements, maintenance and electrical ratings
- Out of the Box: a visual list of the items in the product box
- PC system requirements

The second part details software installation.

Safety Requirements

- Ensure that all devices are turned off before making any connections.
- Do not block the BIS910's ventilation openings.
- Place the BIS910 at least 30cm (12 inches) away from the walls and ceiling.
- Do not position the equipment so that it is difficult to perform device disconnection (appliance coupler).
- **Do not store below 10ºC.** The recommended operating conditions for the BIS910 are 25ºC (78ºF) and 55% relative humidity. The maximum ambient temperature is 28°C; the maximum humidity is 80%.
- Transportation conditions: Ship at 10º - 25 º C.
- Equipment intended for indoor use only, and up to an altitude of 2000m.
- Do not open the system. Due to the danger of exposure to high voltage, only trained service technicians should open the system.
- **Warning!** The unit incorporates a source of hazardous UV radiation and should only be operated with a protective cover or a UV protective filter in place. Otherwise, there is a risk of exposure to radiation.
- Do not place the system near any motorized, vibrating, or magnetic equipment.

- Verify that all devices are turned off before making any connections
- Equipment protection can be impaired if equipment is used in a manner not specified by the manufacturer
- Do not store the system in direct sunlight or in the direct air flow path of an air-conditioner.
- Do not clean the system with harmful solvents. Use only a soft cloth dampened with water.
- Dispose of all plastic bags and wrapping according to local environmental regulations and keep them away from children.

Maintenance

In order to keep the BIS910 in good working order, take the following steps:

- The BIS910 must be cleaned every time a sample is removed. Use a soft non-abrasive, lint-free cloth.
- To clean all parts of the BIS910, use a cloth dampened with water.
- Do not operate while wearing gloves with talcum powder.
- Calibrate the camera once a year, as described in the Camera Calibration section

Electrical Ratings

100– 240 V ~ 50 / 60 Hz 0.6 A

Note: Before performing maintenance on any part of the BIS910, turn off the power to the D-Transilluminator, and connected devices.

Out of the Box – Components and Accessories

BIS910

BIS910

1 7.5 Volt DC Power Supply	3 Drawers (2) [WL/UV]	4 Trans-illuminator Power Supply Cable	5. GelCapture and GelQuant Express Software	6. Inter-locking Cable	7 USB 2.0 Cable

Fig. 13 Components and Accessories

Minimum PC Requirements

In order to install and operate both the BIS910 and the GelCapture software, you must have the following:

- Processor: Pentium Core Due, 1.8 GHz
- Memory: minimum 1 G RAM, recommended 2 G RAM
- OS: Windows XP Pro (English version, SP 3) OR Windows 7 Professional (English version).
- Only PCs with a 32 bit operating system and local Administrator permission at a minimum for the software installation process. After the installation, there is no need of Administrator permission.
- Minimum monitor resolution: 1024 x 768 pixels

Port: 1 free USB 2.0 (USB 1.0 or 1.1 are not compatible

Note: User must set the PC settings to "Never Hibernate"

Hardware Setup

Fig. 14 BIS910Hardware Configuration

Fig. 15 BIS910 Hardware Configuration

Work Flow

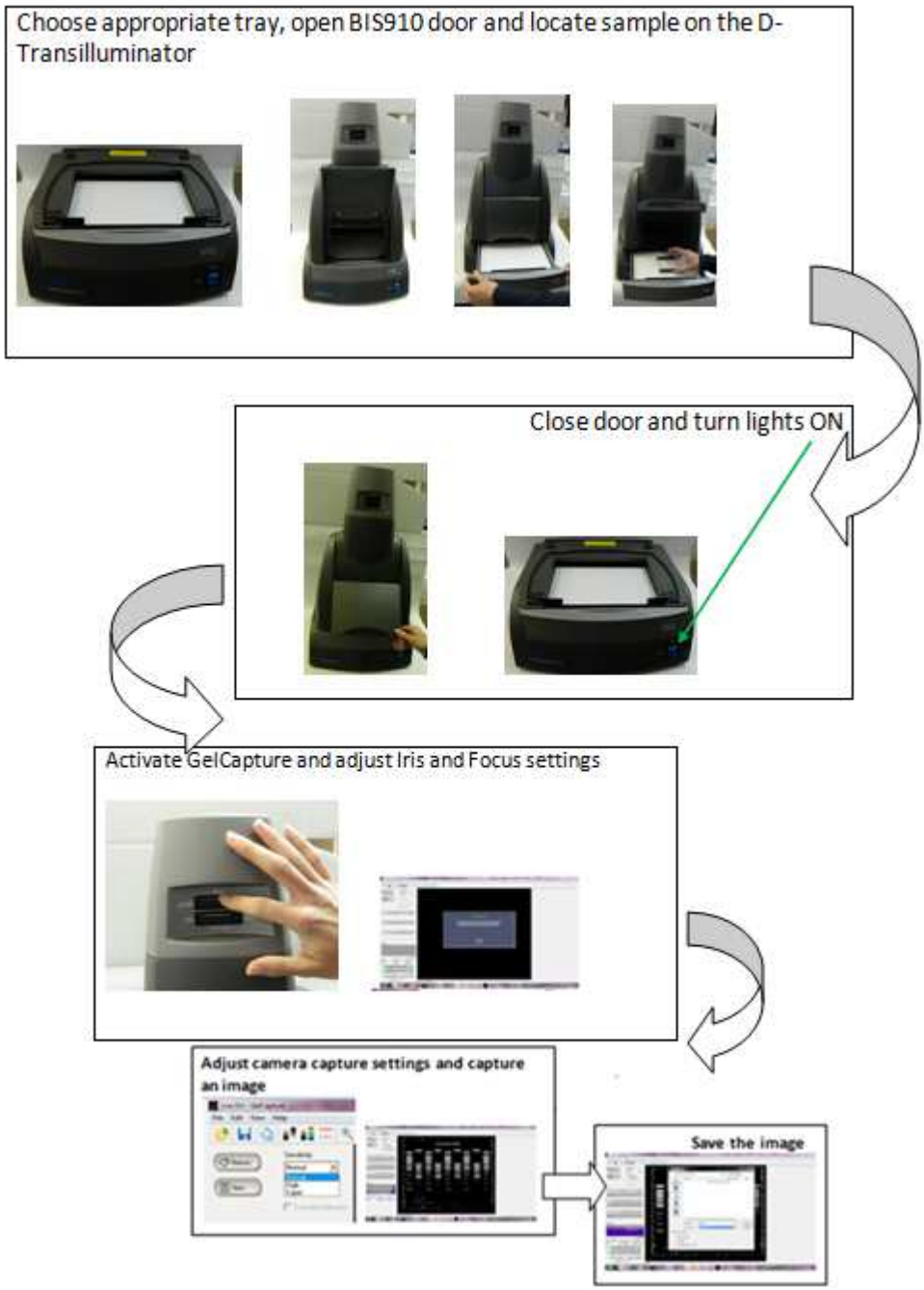

Choose appropriate tray, open BIS910 door and locate sample on the D-Transilluminator
Close door and turn lights ON
Activate GelCapture and adjust Iris and Focus settings
Adjust camera capture settings and capture an image
Save the image

Fig. 16 BIS910 Work Flow

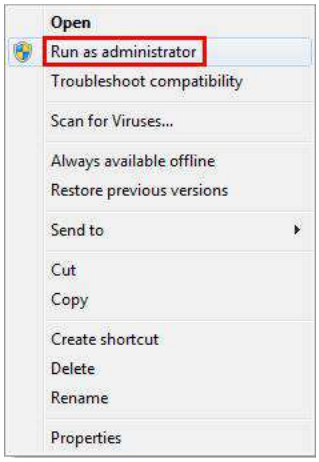
GelCapture Software Installation for Windows 7

Once you have set up the hardware, you can install all of the required software.

To install GelCapture for Windows 7 proceed as follows:

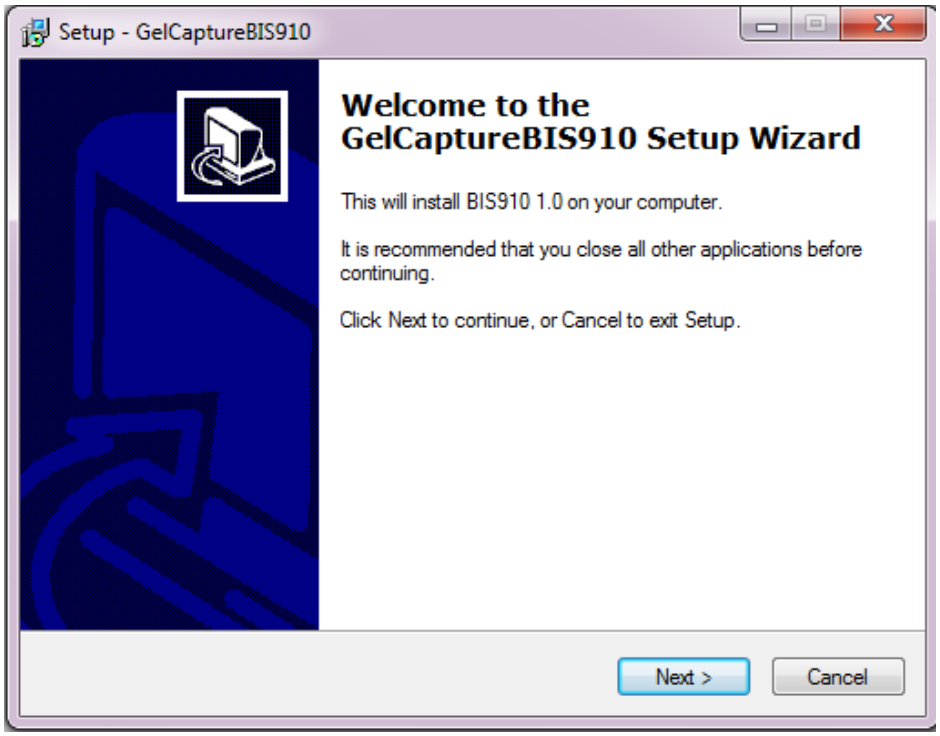
Insert the CD into your PC and right-click the”GelCapture.exe” installation file.

Select “Run as administrator”.

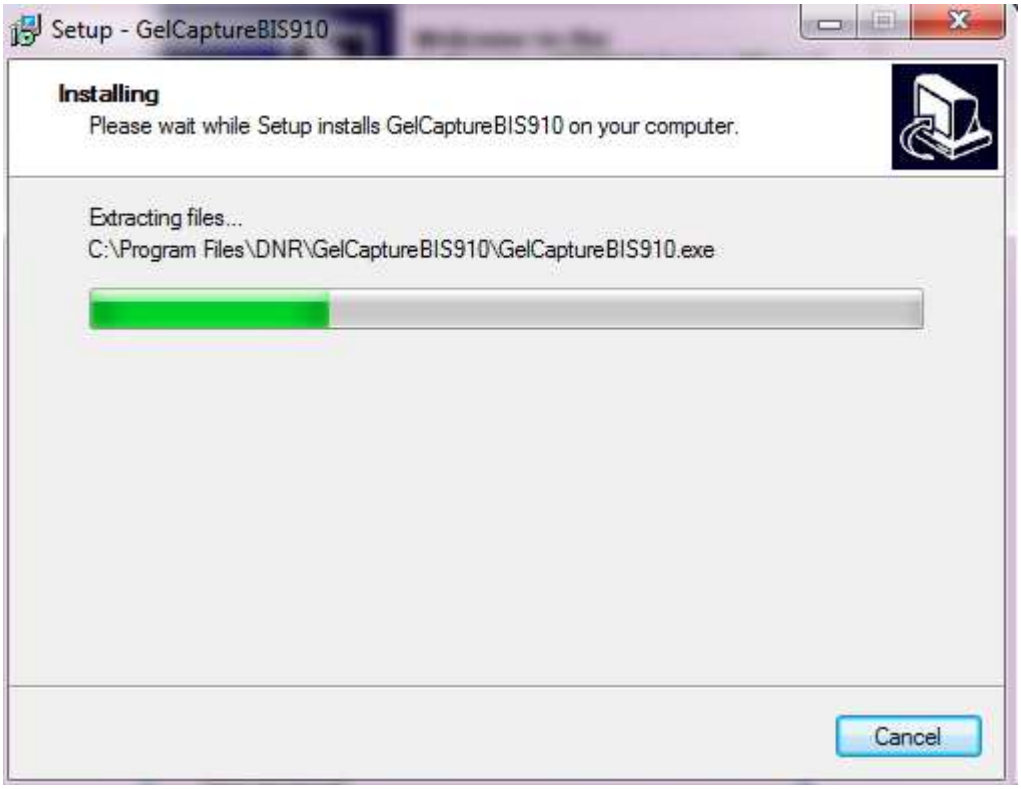


When the next window appears, select “Allow, I trust this program. I know where it's from or I've used it before” to allow the program to run.

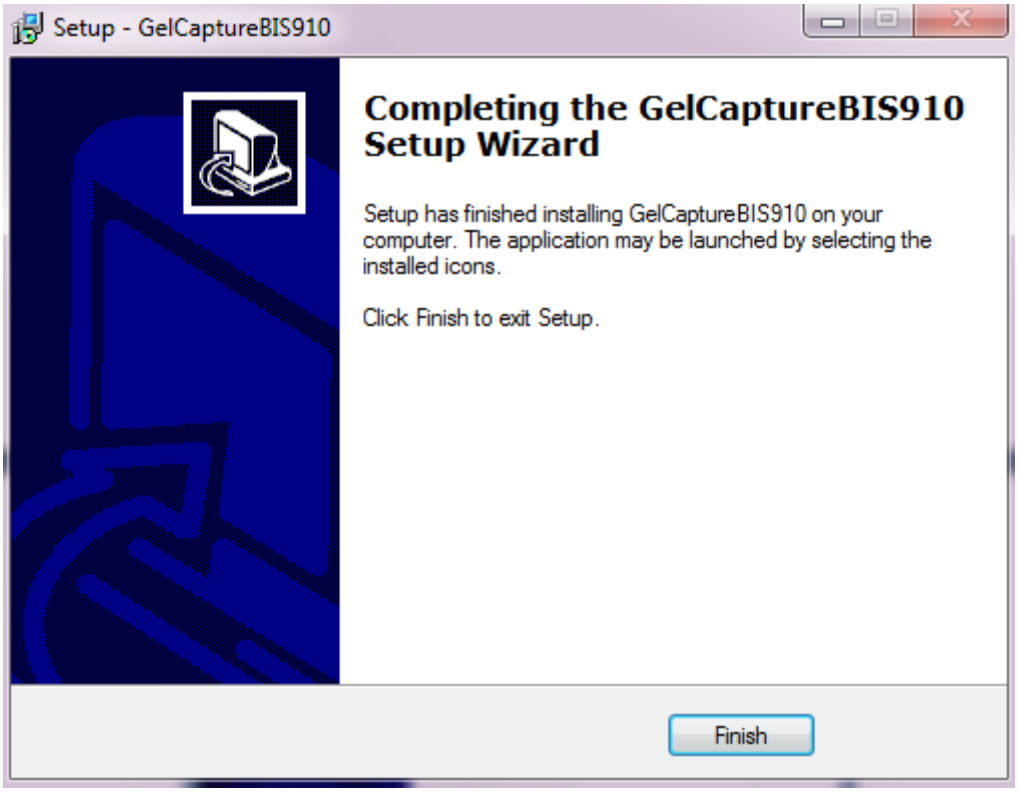
Click “Next” in the 'Welcome to the GelCapture Setup Wizard' window.


Setup - GelCaptureBIS910
Welcome to the
GelCaptureBIS910 Setup Wizard
This will install BIS910 1.0 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

The installation progress window will be displayed with the green progress bar in motion.



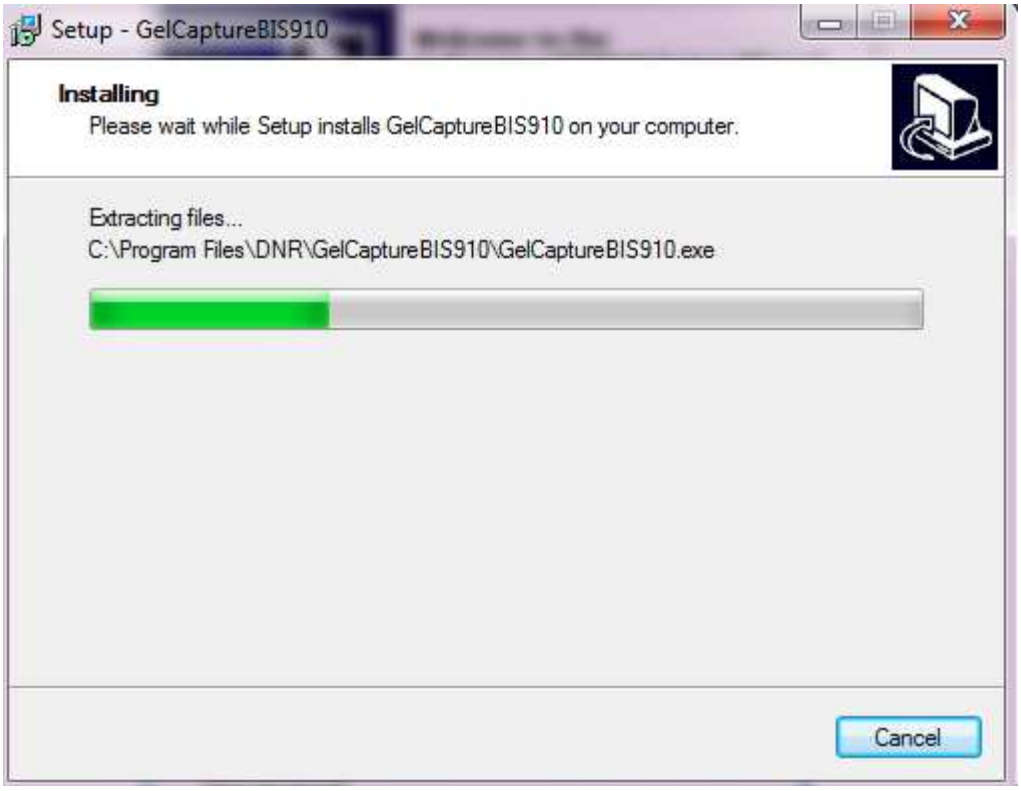
Once installation has been completed, click “Finish” to exit Setup.


Setup - GelCaptureBIS910
Completing the GelCaptureBIS910 Setup Wizard
Setup has finished installing GelCaptureBIS910 on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Finish

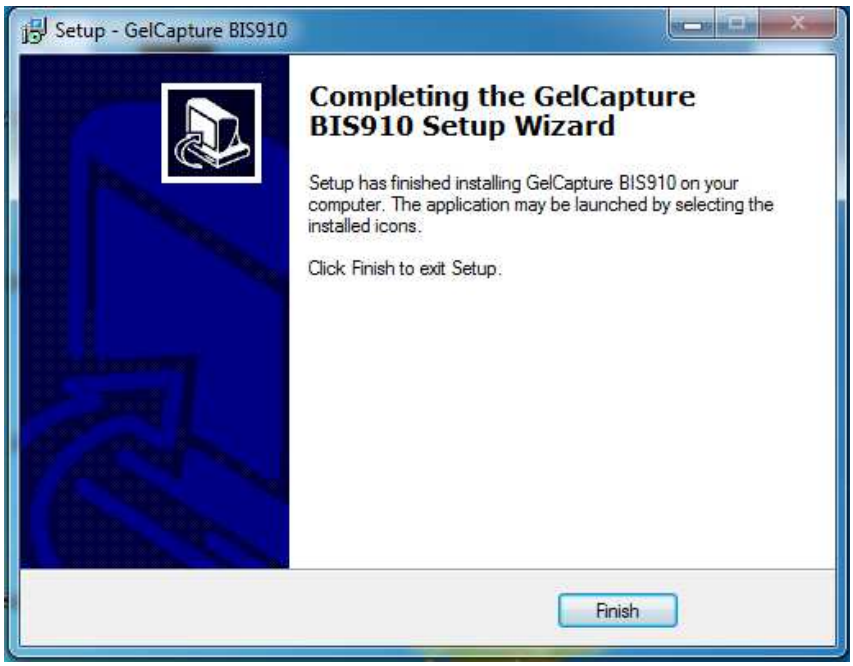
The GelCapture capturing software for Windows 7 is now installed and ready to use.

Installing GelCapture for Windows XP Pro

Insert the CD into your PC and click “Next” in the 'Welcome to the GelCapture BIS910 Setup Wizard' window.



Once installation has been completed, click “Finish” to exit Setup.


Setup - GelCapture BIS910
Completing the GelCapture BIS910 Setup Wizard
Setup has finished installing GelCapture BIS910 on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Finish

The GelCapture capturing software for Windows XP Pro is now installed and ready to use.

BIS910 Camera Driver Installation

Installing the Camera Driver for Windows 7

The camera driver is pre-installed in the BIS910. If however, the user finds that this is not the case, he should install it by following these instructions.

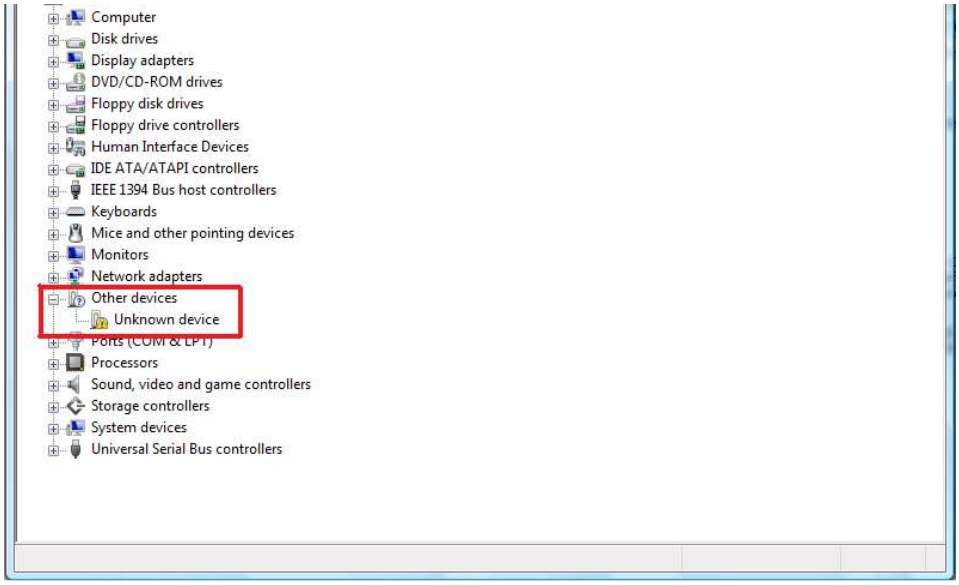
Before installing the camera driver, you must first install GelCapture software on your computer.

Go to the Windows Control Panel by clicking Start >> Control Panel.

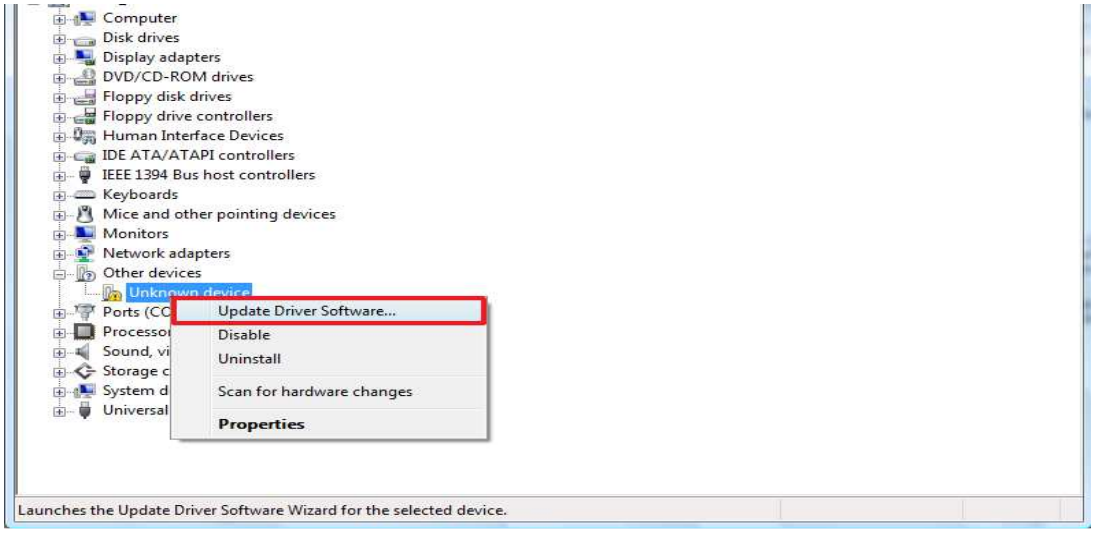
Open the "Hardware and Sound'

Open the 'Device Manager' under 'Devices and Printers'.

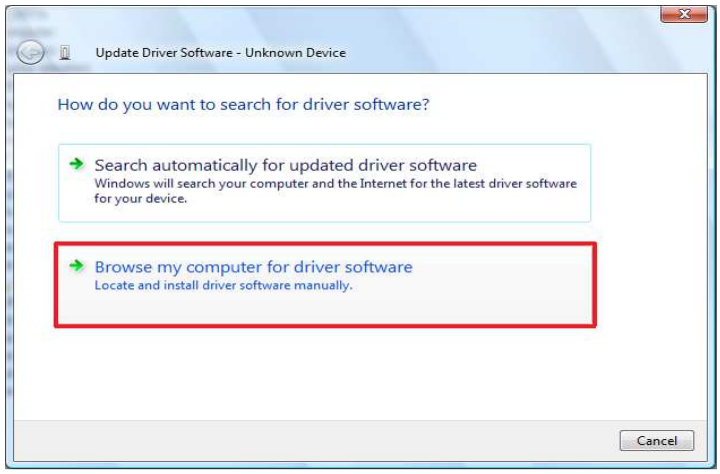
Connect the USB 2.0 imaging system between the system and the PC, and turn on the imaging system camera. The device manager should recognize the new device connection and alert you.



Under “Other devices”, right-click “Unknown device” and select “Update Driver Software”.



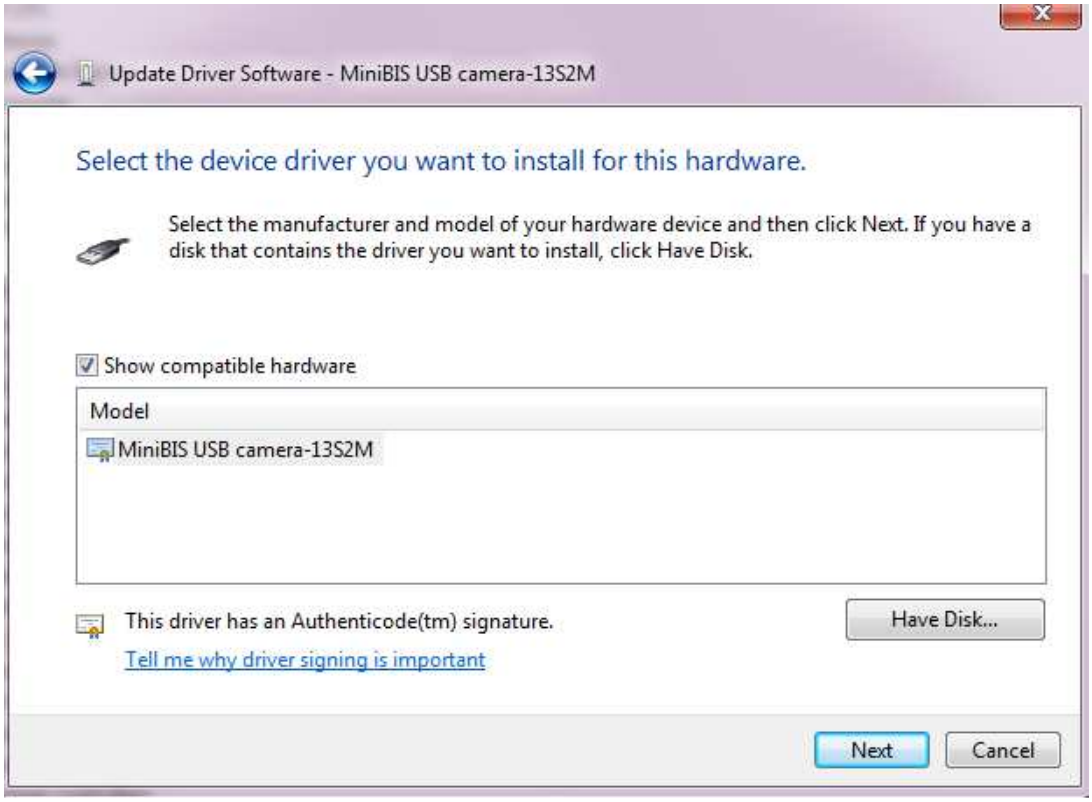
In the “Update Driver Software” window, select "Browse my computer for driver software".


Update Driver Software - Unknown Device
How do you want to search for driver software?
Search automatically for updated driver software
Windows will search your computer and the Internet for the latest driver software for your device.
Browse my computer for driver software
Locate and install driver software manually.
Cancel

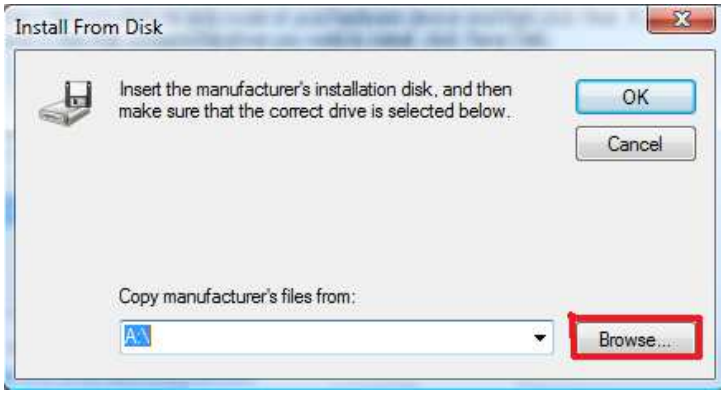
Select "Let me pick from a list of device drivers on my computer".

Update Driver Software - DNR MiniLumi-14SOM
Browse for driver software on your computer
Search for driver software in this location:
Browse...
Include subfolders
Let me pick from a list of device drivers on my computer
This list will show installed driver software compatible with the device, and all driver software in the same category as the device.
Next
Cancel

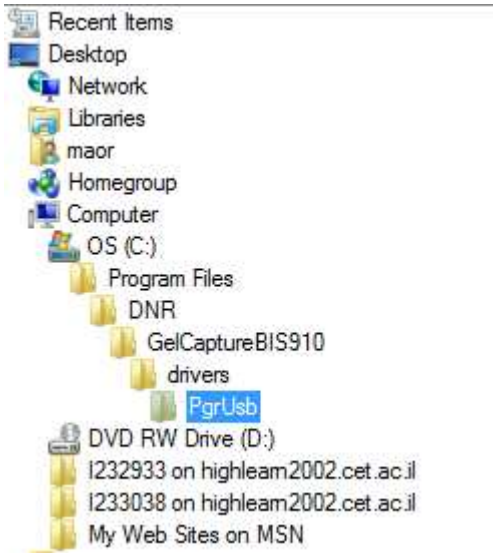
Choose “MiniBIS USB camera- 13S2M” and click 'Have Disk'.


Update Driver Software - MiniBIS USB camera-13S2M
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
MiniBIS USB camera-13S2M
This driver has an Authenticode(tm) signature.
Tell me why driver signing is important
Have Disk...
Next
Cancel

In the “Install From Disk” window, click “Browse”.

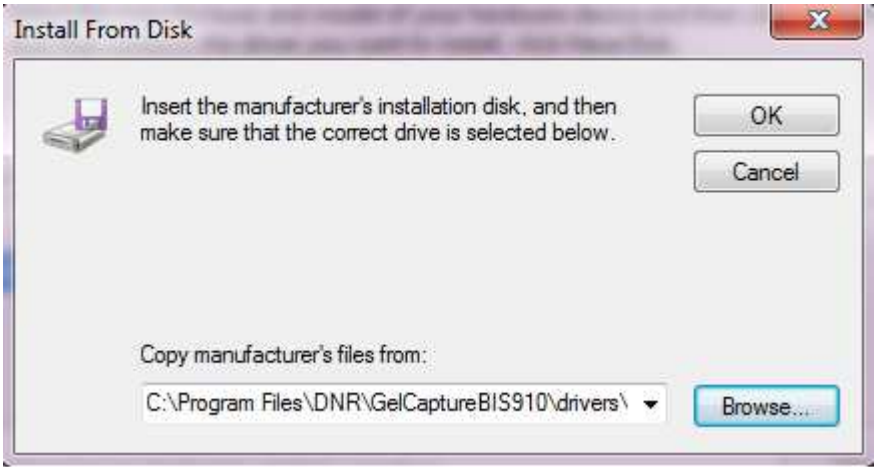


Browse the following location: Computer > Local Disc (C) > Program Files > DNR > GelCaptureBIS910 > drivers > PgrUsb and click 'Open'.

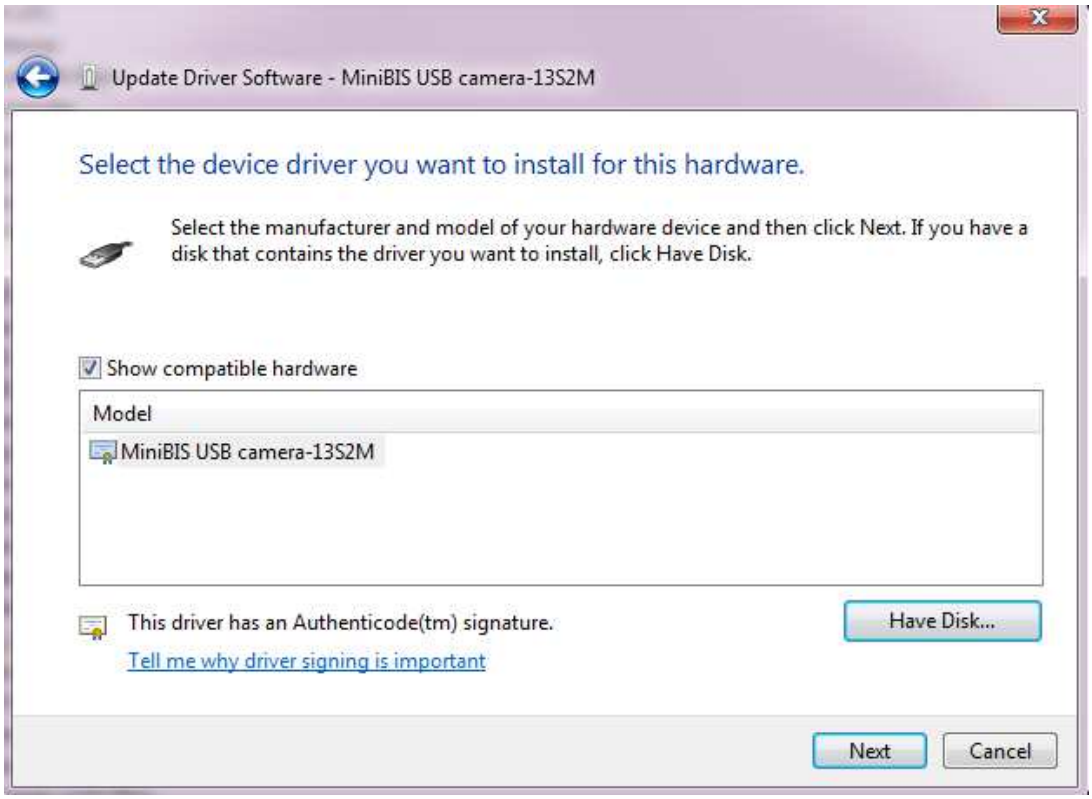


Choose MiniBIS from the PGRUSBCam.inf, and click “Open”.

Click “OK”.


Install From Disk
Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below.
OK
Cancel
Copy manufacturer's files from:
C:\Program Files\DNR\GelCaptureBIS910\drivers\
Browse...

Choose “MiniBIS USB camera- 13S2M” and click “Next”.


Update Driver Software - MiniBIS USB camera-13S2M
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
MiniBIS USB camera-13S2M
This driver has an Authenticode(tm) signature.
Tell me why driver signing is important
Have Disk...
Next
Cancel

After successfully completing the driver update, the successful update window will be displayed. Click “Close”.

Update Driver Software - MiniBIS USB camera-13S2M
Windows has successfully updated your driver software
Windows has finished installing the driver software for this device:
MiniBIS USB camera-13S2M
Close

Close the Device Manager and Control Panel windows.

The BIS910 camera driver is now installed and ready for use.

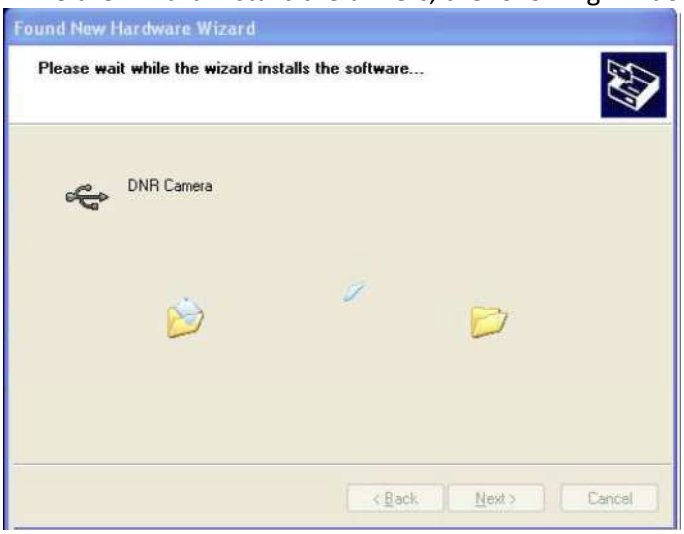
Installing the Camera Driver for Windows XP Pro

The camera driver is pre-installed in the BIS910. If however, the user finds that this is not the case, he should install it by following these instructions.

Before installing the camera driver, you must first install GelCapture software on your computer. Turn the BIS9010 unit on. Windows XP Pro automatically displays the “Found New Hardware Wizard”. Choose “No, not this time” and click “Next”.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

While the Wizard installs the drivers, the following window will be displayed:



If the Windows Logo testing window is displayed, choose “Continue Anyway”.

Hardware Installation
The software you are installing for this hardware:
DNR Camera
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Once the Wizard completes the driver installation, click “Finish”.

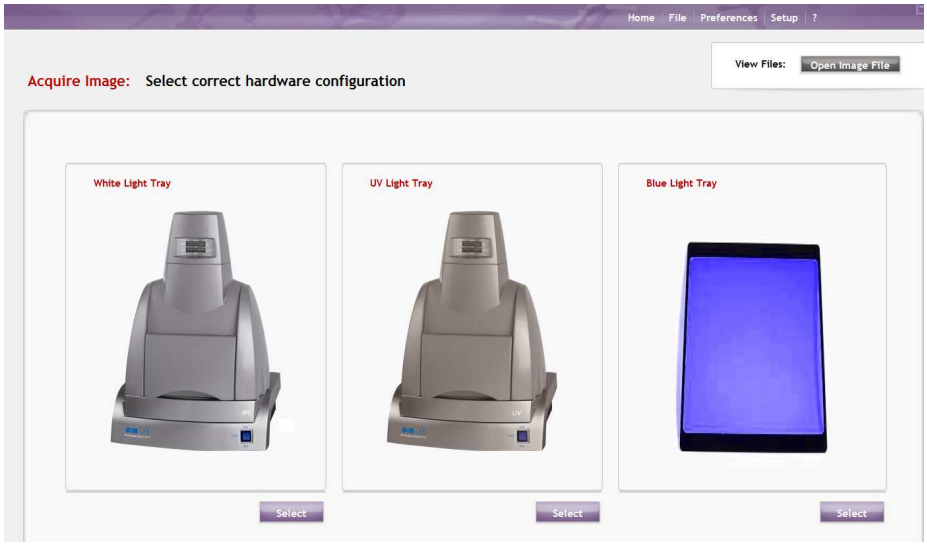
Update Driver Software - MiniBIS USB2
Windows has successfully updated your driver software
Windows has finished installing the driver software for this device:
MiniBIS USB2
Close

Close the Device Manager and Control Panel windows.

The BIS910 camera driver is now installed and ready for use.

GelCapture Overview

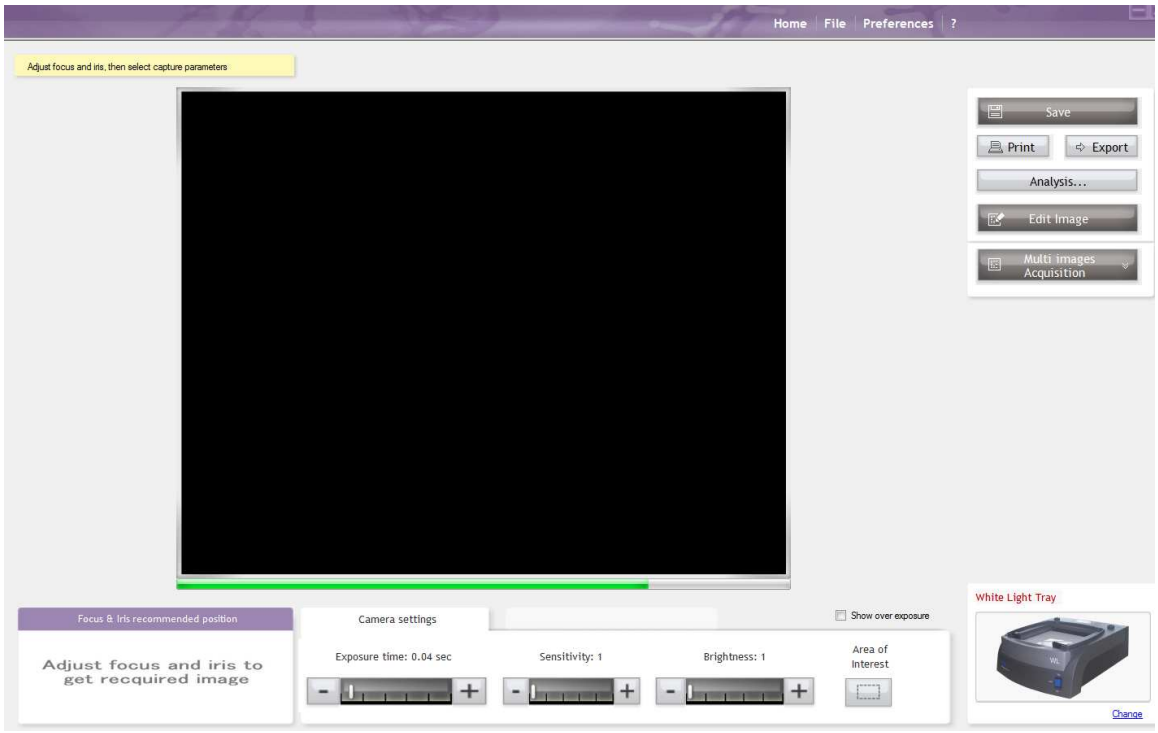
The GelCapture application seamlessly integrates with the BIS910. The application gives you complete control of configuring, capturing, and saving your sampled images for analysis. The interface shows all of the features and tasks on the main screen.



In the entry screen you are required to select between the type of light source you wish to use:

1. UV
2. White Light
3. Blue Light

In addition, you can chose to open an existing image by clicking on the “Open Image File”



Menu bar, Toolbar icons and Function Buttons explained below Main UV Screen here:

Toolbar Icons: Allows quick access to frequently used functions.
Menu Bar: The drop-down menu contains all of the software features.

- **Exposure**: Refers to the image exposure time. This is the time available for the camera sensor to collect emitted light from the sample to form an image. Increased exposure time means more time for light to reach the camera sensor to display sections of the image that were not visible with a lower exposure time

- **Sensitivity**: When the sensitivity is changed by moving the slider, it will change the image lightness. As a result of the Gain changes, the maximum exposure time will be automatically changed accordingly.

- **Brightness**: When the Brightness is changed by moving the slider, it will change the image lightness (it acts more sensitively than the Sensitivity parameters).

- **Area of Interest** - Defines a specific Region of Interest in order to perform various actions on a specific area of the sample either in Live Mode or in a saved image

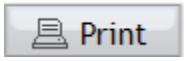
Please adjust the focus and iris for each image.

GelCapture Overview

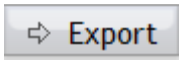
Icons

The most common tasks and features can usually be accessed with a single click of a button.

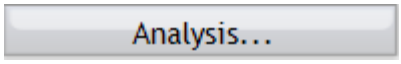
Saves newly scanned images



The image will be printed



Expoerts the image to BMP or JPG file formats



Opens the image in the analysis software (GelQuant Express)

Opens the edit screen

various options of capturing a series of images

GelCapture Overview

The BIS910 system requires that you configure and fine tune in order to optimally acquire an image of each different sample type. This process involves the following steps:

1. Pre capturing verification steps (Transilluminator and camera switches turn on, drawer type choice)
2. Insert the Sample
3. Set the Lights
4. Adjust the Lens and Preview the Image (Positioning)
5. Set the Camera Exposure, Sensitivity and Brightness
6. Save the image

Additional actions:

- Print
- Flat Field
- Analysis
- Using the White Light converter
- Save an Image in jpg and bmp formats
- Using the Imaging Tools

Insert the Sample

The very first step, inserting the sample on the BIS910 drawer, is completed in a few quick steps.

To insert the sample:

1. Turn on the D – Transilluminator and the BIS910 camera.
2. Check that the BIS910 - Bypass switch is set to the BIS910 position.
3. Select appropriate drawer for your sample stain (for a fluorescence application you should use UV drawer; for a sample which stains with visible dyes you should use the WL drawer). Insert the drawer into the D – Transilluminator.
4. Pull open the BIS910 drawer and locate the sample on the center of the drawer. If the transilluminator light was turned on, it automatically switches off as a safety precaution.

Fig. 18 BIS910 Drawer Open

5. Close the drawer and door.

Operating Instructions

Set the Lights

The BIS910 has Trans WL and UV illumination. Press the light selection switch on the front of the D-Transilluminator to the appropriate position.

Fig. 19 D-Transilluminator WL/UV Switch

With the BIS910, you must also check that the Bypass switch at the rear of the D - Transilluminator is set to the BIS910 position.

Fig. 20 BIS910 Bypass Switch

Note:	**The D–Transilluminator may be used as a stand-alone system by setting the BIS910 – Bypass switch to the 'Bypass' option, thereby allowing the user to turn the illumination on while the BIS910 is located next to the D-transilluminator.** **Warning**: since UV radiation is harmful, the user must use appropriate safety equipment when operating the D-Transilluminator without the BIS910 camera tower. The user should also protect his eyes by using WL intensive illumination without the camera tower.

Operating Instructions

Adjust the Lens and Preview the Image (Positioning)

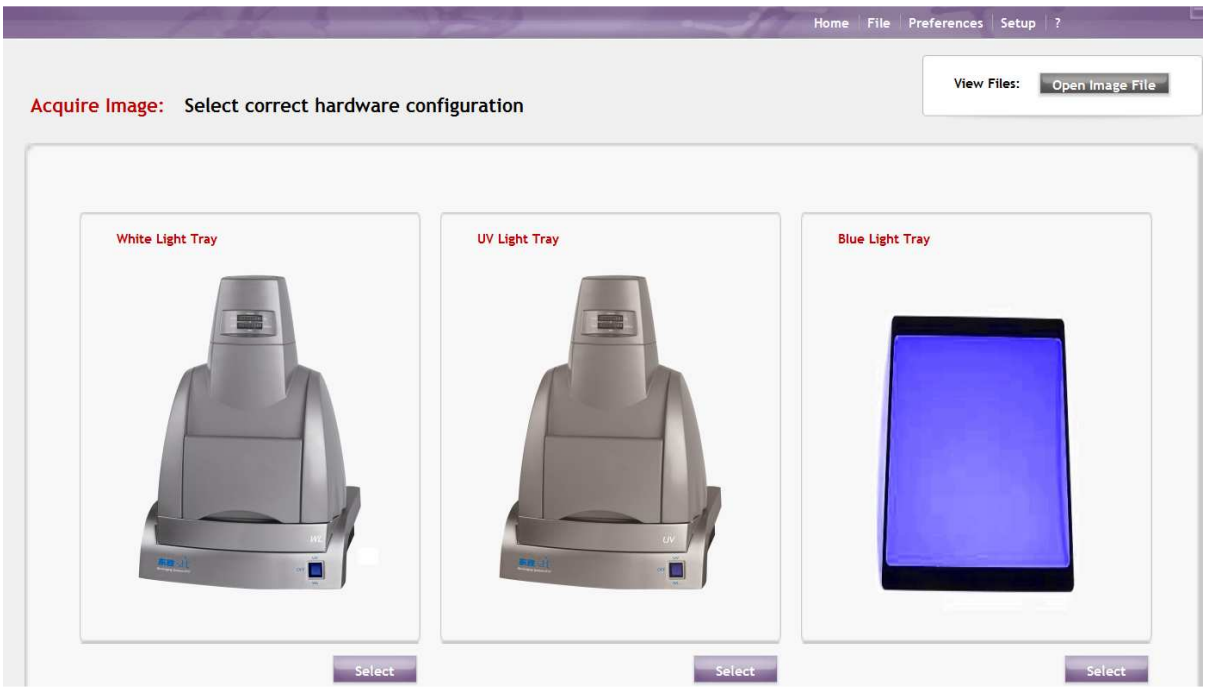
Even though the system uses professional lenses you do not need to be a professional photographer to capture great images.

Often when you capture a new image, you need to make some adjustments after you see the initial results. For this reason, we recommend that you start by previewing the image, making the necessary adjustments, and then getting more previews until you are happy with the results.

To preview the image:

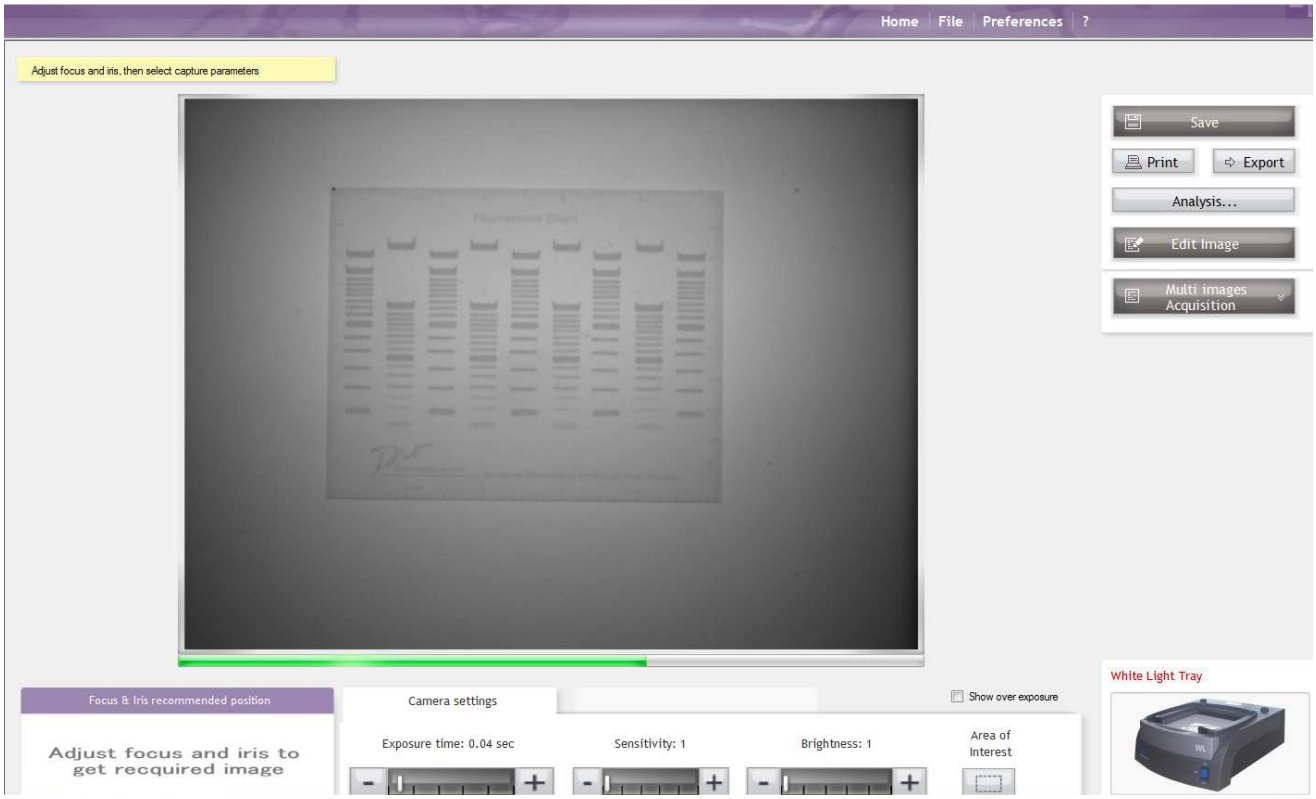
1. Perform all of the required steps to prepare the sample.
2. Activate the GelCapture software by double clicking on the software shortcut or by using the start menu.

3. The opening screen appears and asks you to define the drawer type.



Operating Instructions

The software will be opened in Preview position.

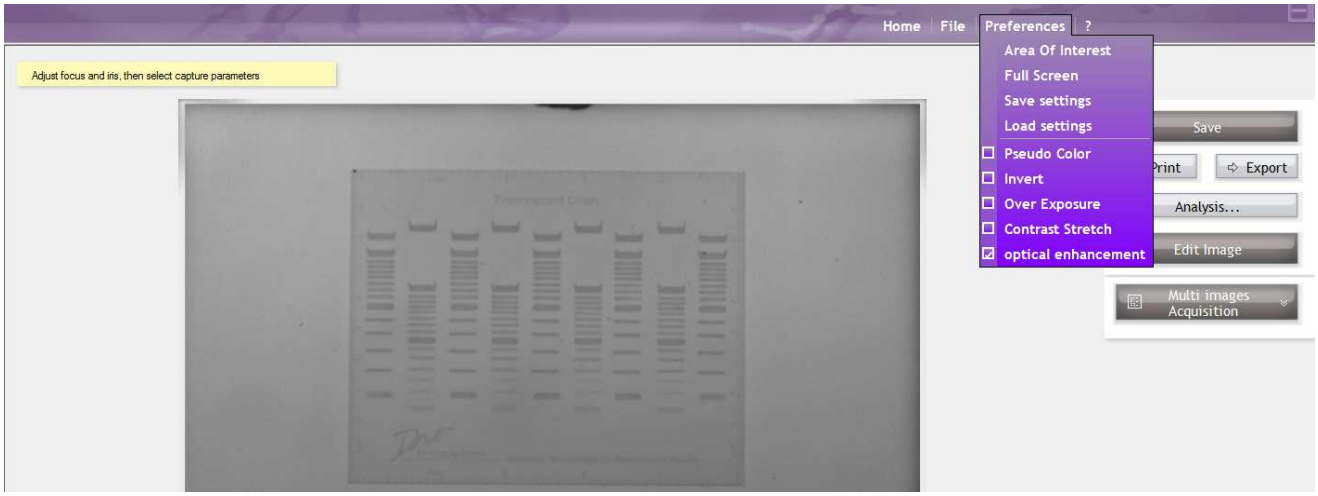


gggg

Operating Instructions

While you are in Preview mode, finger-tip adjust the following dials which are located in the BIS910 camera tower:

Iris: Adjust it till you reach satisfactory image illumination. It is recommended to activate the 'Over Exposure icon (see Page 80 for using over-exposure).



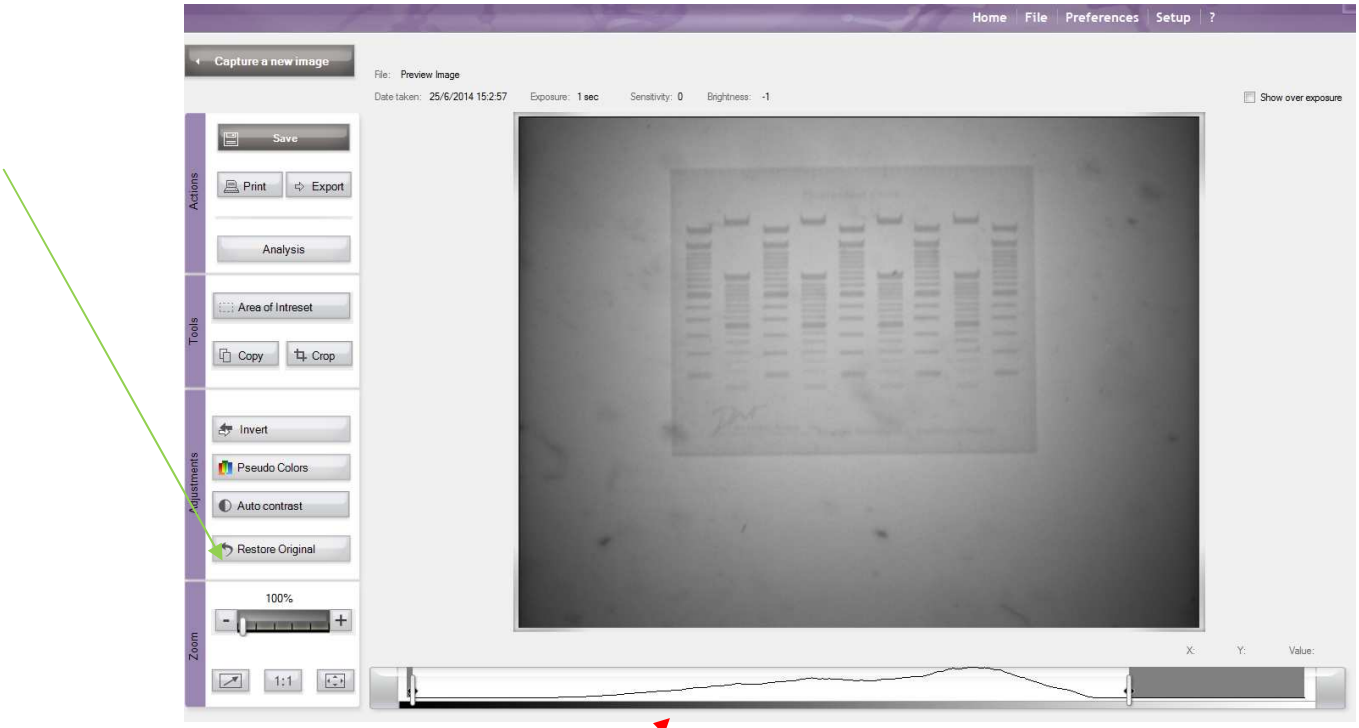
Close position: the iris is close and minimum light will go from the sample to the camera.
Open position: The iris is open, and maximum light will go from the sample to camera

Focus: Adjust this dial in order to obtain a fully, focused image.

For professional focus adjustment, you can use the Histogram bar in the Edit screen (see image below pointed with a red arrow).

Slide the focus slide bar till you obtain the ultimate Edge number. Adjust the focus until the **Edge** reading is at its highest: The higher the number, the sharper the image.

The user should be aware that every image and every sample in a given illumination intensity will have a different Edge number.
If you are not happy with the results, you can revert the results received after adjusting the histogram by selecting Restore Original (see image below pointed with a green arrow).

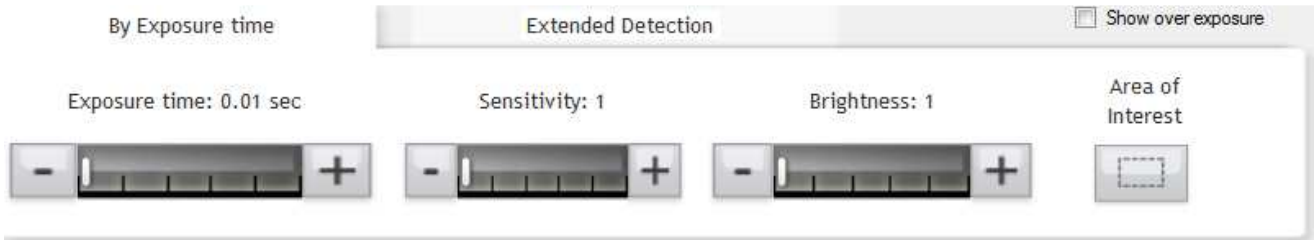


Histogram Bar

Operating Instructions

Set the Camera Exposure, Sensitivity and Brightness

Set the exposure time by moving the sliders to the appropriate exposure time until you can clearly detect your sample.



Set the Sensitivity

Sensitivity is a feature which amplifies the signal emerging from your sample. A higher GSensitivity setting will result in a brighter image.

As this feature amplifies any signal from the image, you may see some background noise.

Since it is preferable to maintain a dynamic image range, increasing the Sensitivity parameters will decrease the maximum exposure time.

Set the Brightness

Increasing the Brightness will result in a brighter image. Increasing the Brightness parameters will provide a less dramatically image brightness effect than the Gain.

Operating Instructions

Saving the Image

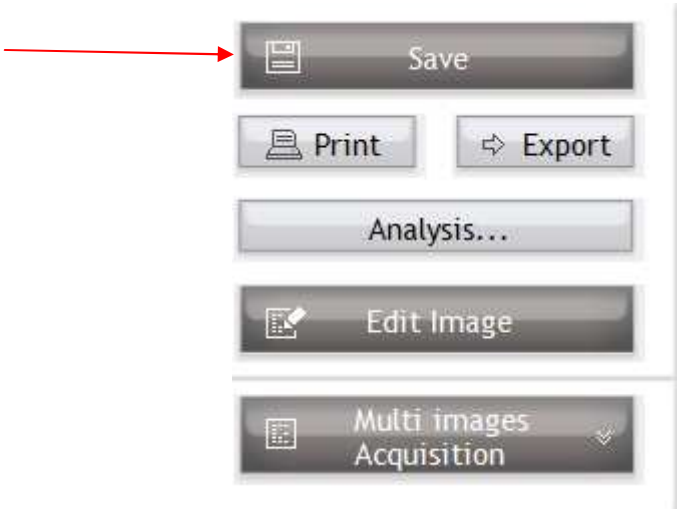
GelCapture allows you save images in .TIFF, .BMP and .JPEG formats. You should be aware that tiff format saves all the raw data of the image, and it is highly recommended to choose this format while intending to analyze a given image. Other formats save only part of the image information, and therefore provide less accurate results from image analysis process.

Saving options:

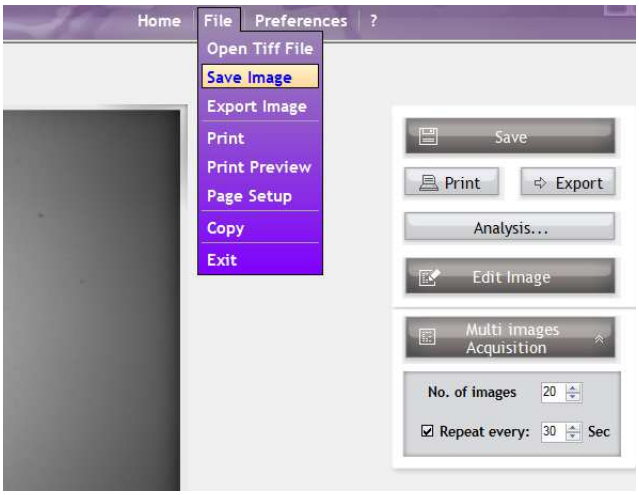
a. Saving a single image:

Saving image in tiff format:

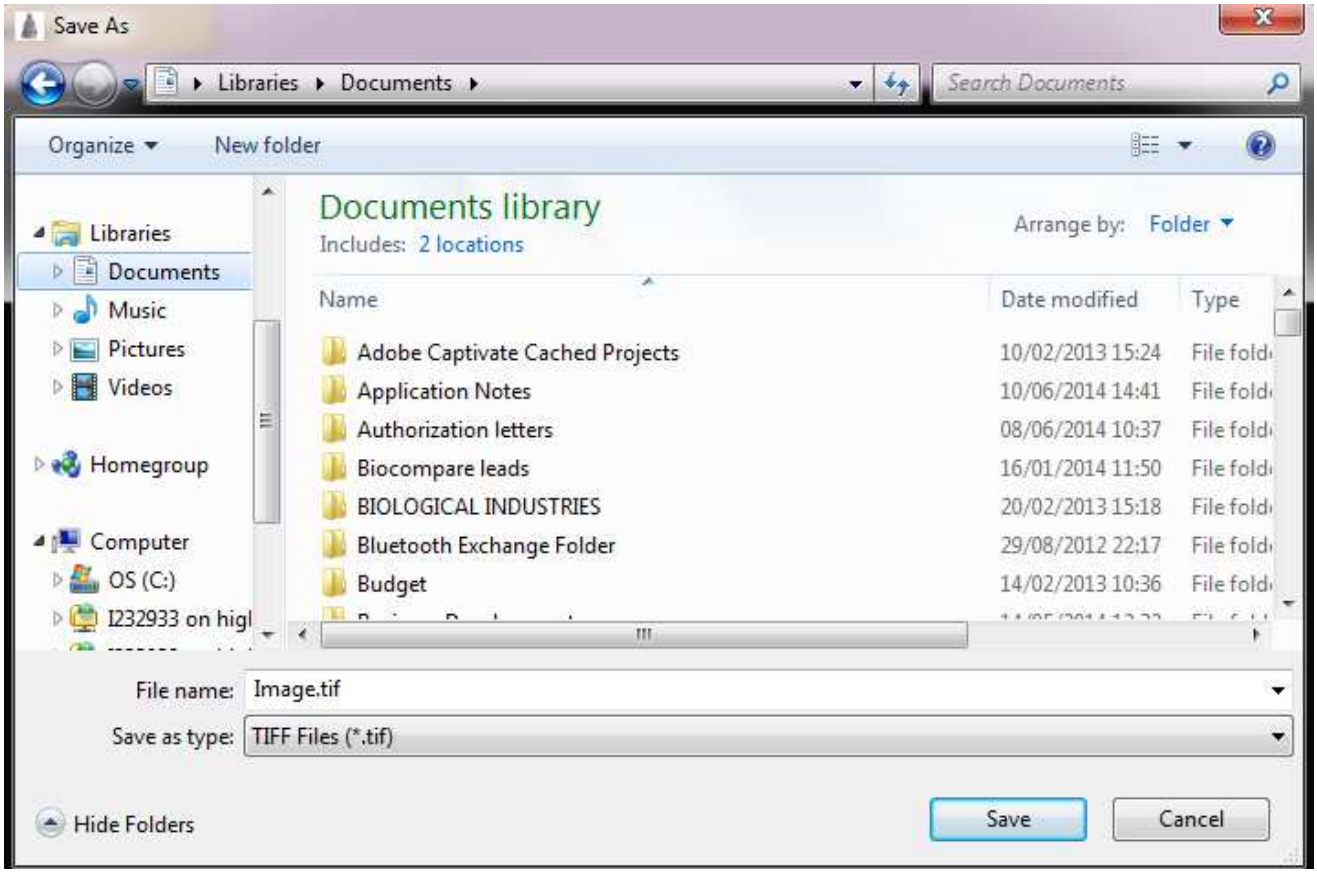
After determining the settings for an image and if you are happy with the results, you should save the image by choosing one of the following buttons:



Or



Clicking on each one of the above buttons will display a pop up save image dialog as shown below:



You should provide an image name at the 'File name' section.

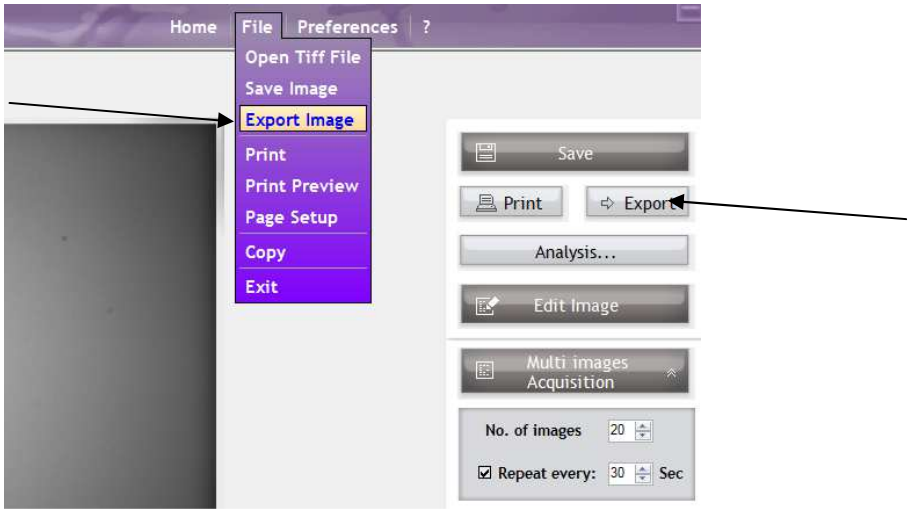
Notes:

1. **The tiff format saves all the image raw data**. As a result, the image sizes are slightly bigger (several MB). If you would like to save the image in a lighter format, save it as BMP / JPEG format. You should be aware that while using analysis software it is highly recommended to use images in tiff format to gain accurate results.
2. **While saving images in BMP / JPEG formats,** these saving options are eliminated.
3. **Some PC's lack the ability to automatically open 16 bit tiff files format**, as captured with the BIS910. If you want to save an image for other reasons than analyzing it, you can save it in BMP / JPEG format which can be opened in most of the PC's.

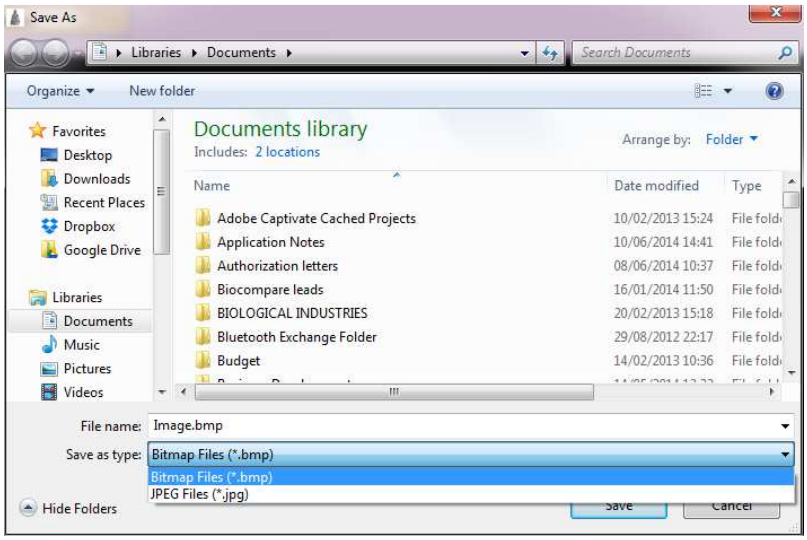
Saving the Image in BMP / JPEG Formats

If you would like to save the image in a lighter image size than the tiff format, you can choose either BMP or JPEG formats. You should be aware that DNR highly recommends analyzing only images which are saved in tiff format.

In order to save the image in these formats you need to select the Export Image option. There are 2 possible ways to do so; please see below image.



A. Now you can choose at the Save Dialog screen between the BMP and JPEG formats.

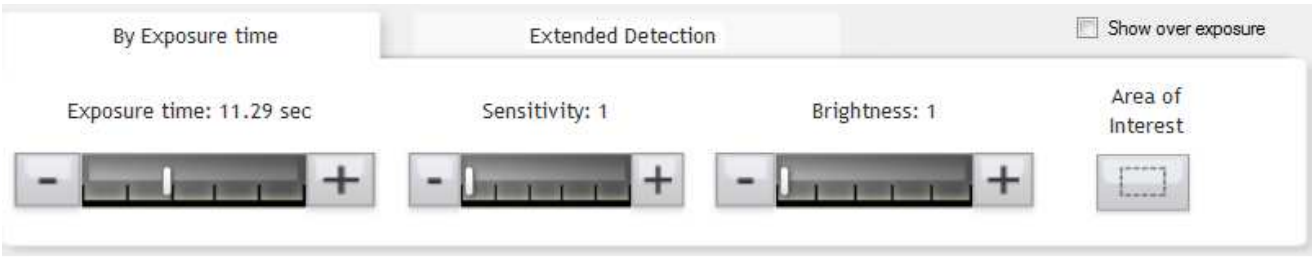

Save As
Libraries ▸ Documents ▸
Search Documents
Organize
New folder
Favorites
Desktop
Downloads
Recent Places
Dropbox
Google Drive
Libraries
Documents
Music
Pictures
Videos
Documents library
Includes: 2 locations
Arrange by: Folder
Name
Date modified
Type
Adobe Captivate Cached Projects 10/02/2013 15:24 File fold
Application Notes 10/06/2014 14:41 File fold
Authorization letters 08/06/2014 10:37 File fold
Biocompare leads 16/01/2014 11:50 File fold
BIOLOGICAL INDUSTRIES 20/02/2013 15:18 File fold
Bluetooth Exchange Folder 29/08/2012 22:17 File fold
Budget 14/02/2013 10:36 File fold
File name: Image.bmp
Save as type: Bitmap Files (*.bmp)
Bitmap Files (*.bmp)
JPEG Files (*.jpg)
Hide Folders
Save
Cancel

Operating Instructions

Capturing a series of images

In order to capture a series of images select Multi Images Acquisition

You need to set the number of images you wish to capture. The exposure time is determined by moving the scales (see image below).



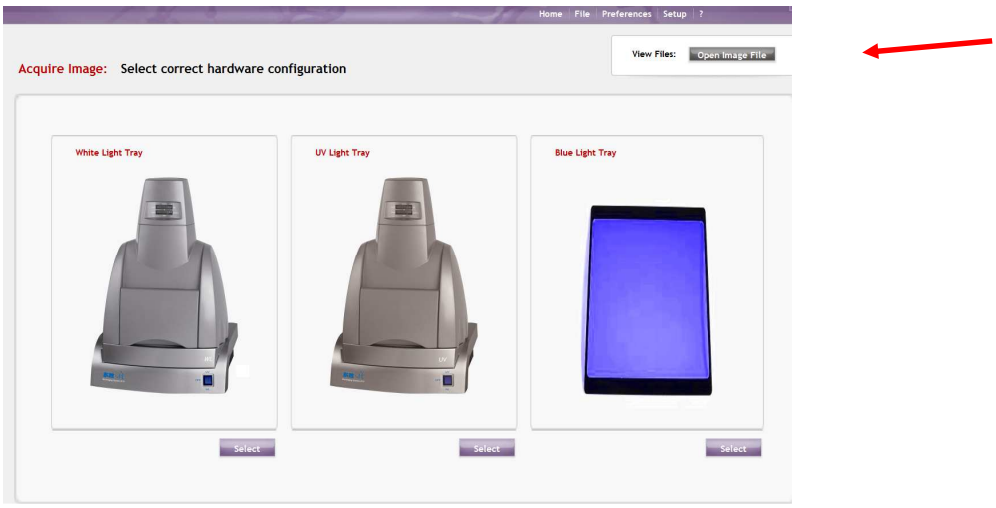
In addition it is possible to create a repetition rule by marking the “Repeat every” button. The time is determined by the user.

Operating Instructions

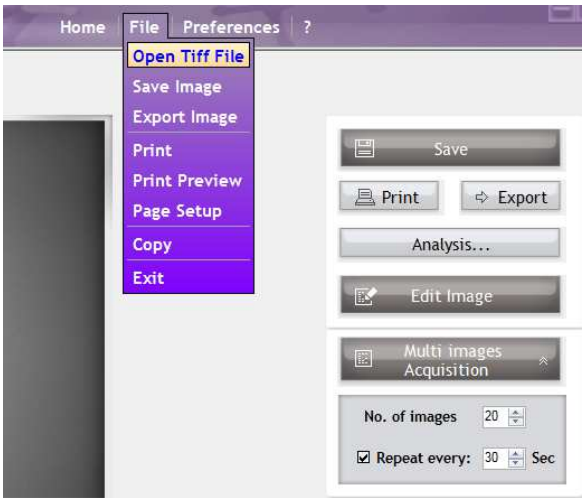
Open an Image File

You can open an image in two possible ways:

1. **On the opening screen, select Open Image File (see image below with red arrow)**

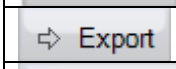
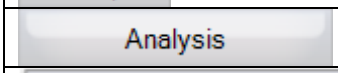
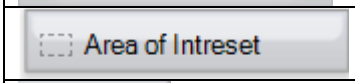
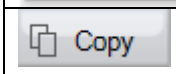
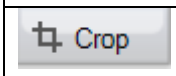
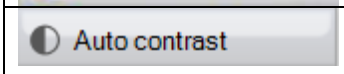


2. **On the Toolbar, select File> Open Tiff File**



Operating Instructions

When a user opens image/images, the following screen will be shown.

	Saves newly scanned images
	Prints the image
	Save the image in BMP/JPG file formats
	Opens the image in the analysis software (GelQuant Express)
	The Area of Interest feature lets you define a specific area of the sample in order to perform various actions on itfggtgttgt
	Copies the image to the clipboard for pasting in any number of Window applications
	Defines a specific Region of Interest in the Preview Screen in order to perform various actions on a specific area of the sample either in Live Mode or in a saved image
	Presents an inverse version of the image
	Shows the image in pseudo colors
	Automatically increases the stretching of the image. This option helps reveal low concentrations of biological samples in the gel.
	Restores any stretching actions to the original image values.
	Digitally zooms in and out to the image.
	Displays the image so that it fills the entire screen. To return to the GelCapture main screen press **[Esc]**.
	Presents the image in its actual size.
	Resizes the image to fit within the image window.

In some cases the resulted image provides only part of the expected bands. In order to reveal more bands if any, you may use the Automatic stretching button. It will automatically stretch the image signals by a software algorithm, and will reveal some low intensity bands. You can also use the Contrast Low/High level sliders, as a manual, software stretching action.

If you would like to return to the original image parameters after stretching, you should click on the 'Restore Original' button.

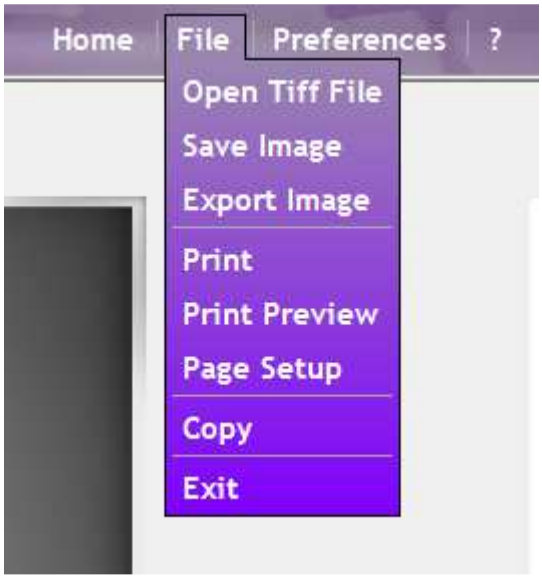
Note:	**User should be aware that if you make stretching changes to the image and then save them, those changes are saved with the image when opened in GelCapture. If however, you open the same stretched image in any other software apart from GelCapture, the image appears as it did when originally captured.**

Operating Instructions

The image statistics is presented above the image to the left

Using the Imaging Tools

Home – Clicking on this button will take you to the opening screen.



File

Open Tiff Image – Opens a saved image
Save Image – Saves newly scanned images
Export Image – Saving image in BMP/JPG
Print – Prints the image
Print Preview – Allows you to preview the print before printing
Page Setup – Allows you to arrange the print before printing
Copy – Copies the image to the clipboard for pasting in any number of Window applications
Exit – Exits the software

Operating Instructions

Preferences

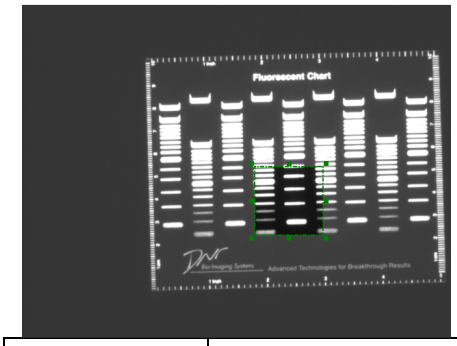
Area of interest Defines an area of interest. A green frame will appear on screen, as seen in the below image. Adjust the image size or position. You can either stretch the pivot points on the frame or mouse-left click and drag down to open a new frame of a region of interest.

Place the cursor anywhere within the green frame and right click to display the menu options.

A green frame will appear on screen, as seen in the below image.

Adjust the image size or position. You can either stretch the pivot points on the frame or mouse-left click and drag down to open a new frame of a region of interest.

Place the cursor anywhere within the green frame and right click to display the menu options.

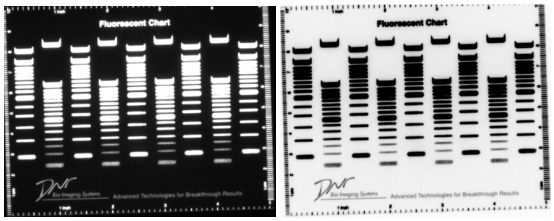


Full screen	Displays the image so that it fills the entire screen. To return to the GelCapture main screen press **[Esc]**.
Save Settings	If you wish to save a procedure for future use, clicking on Save Settings, will save the settings of the proceudre (exposure time, sensitivity and brighness)
Load Settings	If you wish to work with a saved procedure, clicking on Load Settings, will set the settings of the proceudre for this current experiment (exposure time, sensitivity and brighness)
Pseudo Color	Shows the image in pseudo colors
Invert	Presents an inverse version of the image
Over Exposure	Shows in red those areas that are overexposed.
Contrast Stretch	Automatically increases the stretching of the image. This option helps reveal low concentrations of biological samples in the gel.
Optical Enhancement	The image presented both in UV and WL is processed through an algorithm which eliminates the lens distortions. Un-checking the Optical Enhancement button, will cancel the algorithm and will present the original image captured.

?

About GelCapture -displays the information about the software version you are working on.
DNR Website – directs you to DNR's website.

Inverted Image



An inverted image shows the image with the color scale inverted: light areas appear dark, and dark ones appear light, much like a negative. This feature is useful in such scenarios as helping the user to decipher dark areas.

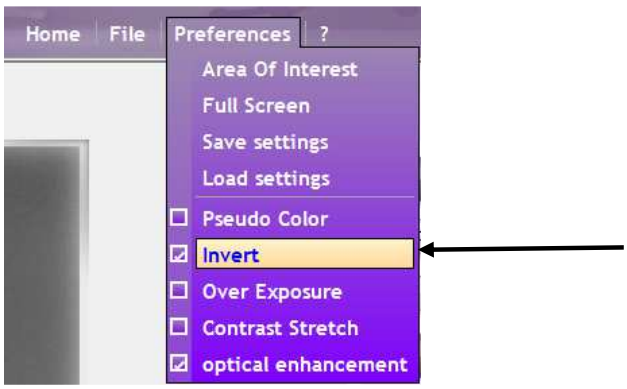
Inverted Image

Inverted image inverts the color scale, i.e., light areas appear dark and dark areas appear light, much like a negative. This feature is particularly useful when you need to decipher close bands.

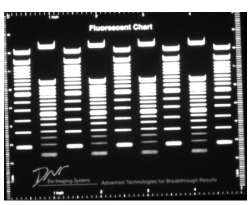
To Invert an Image

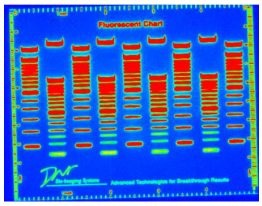
Click the Invert Image icon

. Click the icon again to revert to original view of image. You can also view an Image in invert position by **selecting Preferences> Invert**



Pseudo-color

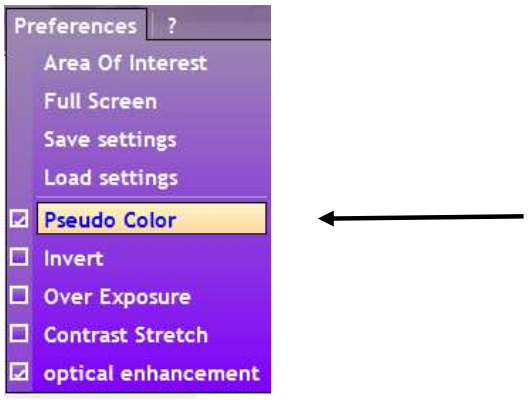




To View an Image in Pseudo-color

Click the Pseudo-color icon.

Click the Pseudo-color icon again to revert to the original view of the image.
You can also view an Image in Pseudo-color **by selecting Preferences> Pseudo Color**

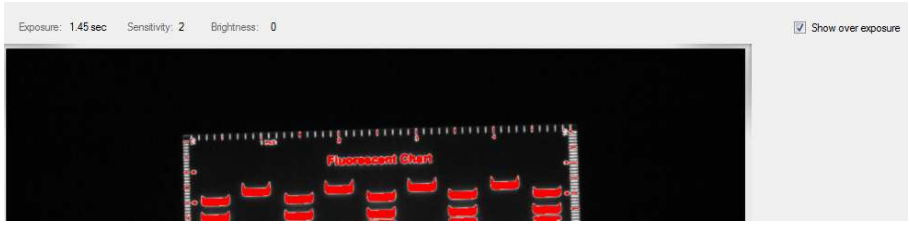


Overexposure

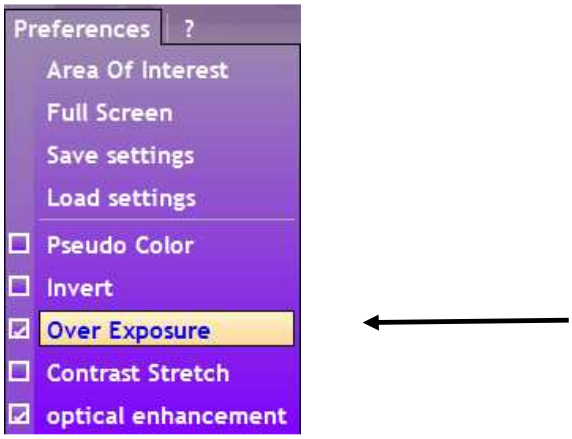
Overexposure occurs when the camera receives too much light, which usually results in white or bright areas. This phenomenon leads to inaccurate results when analyzing the image information. In order to avoid this distortion, GelCapture is equipped with the Overexposure tool which displays overexposed areas in red.

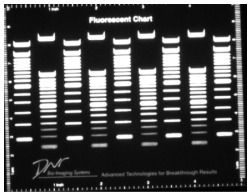
To View an Image Using the Overexposure Tool

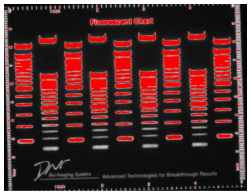
Click the Overexposure button.



Unclick the Overexposure button again to revert to the original view of the image.
You can also view an Image in over exposure by **selecting Preferences> Over Exposure**







Troubleshooting

Before you contact support, it is recommended that you read over this section to see if you can resolve the problem by yourself. To make this as easy as possible, we have created a list of the most common problems and their possible solutions.

I don’t see any image on the screen.

Try one of the following:

- Make sure that the Transilluminator is turned on.
- Wait a few seconds. Each time the settings change, it takes time for the image to be displayed.
- If you are working with White Light, then check that the iris is slightly closed. Move the Iris dial toward the Close side to reduce the amount of light entering the iris. If you are working with UV light, the iris should be almost completely opened. Move the Iris dial toward the Open side to increase the amount of light entering the Iris. If it is a very dark sample, the iris can be completely opened
- Check that the lighting conditions are satisfactory.

The image is out of focus.

Check that the focus is set with its center mark aligned with the center mark on the BIS910.

The frame counter is progressing, but the picture is black.

- Check that the light on the Transilluminator table is switched on.
- Verify the iris position. When working with UV light, the iris should be almost completely opened. If it is a very dark sample, the Iris can be opened all the way.

The image quality is poor.

Recalibrate the camera as explained in the Camera Calibration section of the Installation Guide. Please note that this takes at least 40 minutes to complete

Glossary

CCD

The CCD (charge-coupled device) is a major piece of technology in digital imaging. In a CCD image sensor, pixels are represented by capacitors. These capacitors are based above the threshold for inversion when image acquisition begins, allowing the conversion of incoming photons into electron charges at the semiconductor-oxide interface; the CCD is then used to read out these charges. Although CCDs are not the only technology to allow for light detection, CCD image sensors are widely used in professional, medical, and scientific applications where high-quality image data is required.

Dynamic Range

The range that a sensor is capable of differentiating. If the sensor can differentiate between two points in an image, then each point is translated into a pixel of the image; if the sensor is not able to differentiate, then the two points will be pixels of noise. Dynamic Range is also referred to as Signal to Noise Ratio (SNR).

Exposure Time

The length of time that light is allowed to pass through to the camera lens to form an image.

Fluorescence

The process whereby a fluorescent molecule is excited at one wavelength and immediately re-emits it at another (longer) wavelength.

Gain

Gain is a camera feature which increases or decreases the strength of an electrical signal. When the gain is increased the image's brightness also increases, but so does any electronic "noise". This results in a brighter image with less clarity.

Glossary

Iris: A mechanical diaphragm which adjusts the lens aperture. When there are high levels of illumination then iris should be closed, and when there are low levels of illumination the iris should be opened.

Pixel
A pixel, or picture element, is the basic unit that the camera uses to build an image. Image size is also measured in pixels.

Pseudocolors: Illustrates the levels throughout the sample's image. The cooler colors, such as blue indicate where the image is undersaturated, and the hotter colors, such as yellow or red, indicate where the image is oversaturated. Green indicates the levels are in the mid-range.

Quantum Efficiency
A measure of the efficiency by which photons generate electrons in a pixel. The Q/E is function of the camera sensor in regards to wavelengths.

Resolution
Although definitions vary, the most common one is the number of pixels on a camera.